REMARKS/ARGUMENTS

Claim 7 has been amended.

The Examiner rejected claims 1-5, 11, and 15-19 under 35 U.S.C. 103 (a) as being unpatentable over Applicants' Admitted Prior Art (APA) in view of Baker (USPN 4,913,509). However, the Examiner argues APA in view of Douklias. If the Examiner is rejecting the claims in view of Baker, the Examiner has failed to specifically point out the Examiner's reasons for such a rejection. In addition, the arguments in the AMENDMENT A, provide the applicant's reasons as to why the claims are not made obvious by APA in view of Baker, which are as follows:

The Examiner failed to point out anything in Baker that states that a "port" in Baker is an optical input/output switch. The "port" in Baker is not an optical input/output switch. Col. 4, line 61, of Baker describes the "port" as "port 22". FIG. 1 of Baker shows the port 22 as an electrical input/output device, not an optical switch. Therefore, Col. 3, lines 59-60, of Baker is stating that any known failure detection mechanism of electrical I/O port 22 may be used. Therefore, Baker does not teach any known detection mechanism for an optical switch but an electrical switch. Test light sources and light detectors, as recited in claims 1 and 11, are not known detection mechanisms for failures in electrical switches.

In addition, neither the admitted prior art nor Baker suggests that each test light source is connected to an optical input switch. Neither the admitted prior art nor Baker suggests test light sources. The applicants respectfully request that the Examiner provide a reference for the test light sources. In addition, Baker is unrelated to the recited invention, since Baker is related to optical regeneration and electrical switching. Therefore, it would not be obvious to combine Baker with the admitted Art. For at least these reasons, claims 1 and 11 are not made obvious by Admitted Prior Art in view of Baker.

If the Examiner meant to reject claims 1-5, 11, and 15-19 under APA in view of Douklias, then please note the following: The Examiner argues that it would have been obvious to modify the device disclosed in APA such that it further comprise a plurality of optical detectors connected to the optical output switches as taught in Douklias, for at least achieving an optical switching apparatus and method that could alert an observer or components in the event

of a malfunction. The Examiner failed to point out anything in the APA or Douklias that discloses or suggests the use of such optical detectors for testing for malfunctions. The optical switches of Douklias are used as shutters to block and pass free-space optical beams, as described in col. 3 line 18-19, claims 1-3, and claim 5 of Douklias, whereas in the present disclosure the optical switches are used to redirect fiber-coupled optical beams. The optical detectors of Douklias are used for imaging a free-space hologram, whereas in the present disclosure the optical detectors are used to measure the amount of optical power carried by an optical fiber. The optical detectors of Douklias are not used to test for malfunctions. The Examiner did not point out anything in APA or Douklias that suggest a need for such testing or that such a need could be met using optical detectors. The invention provides the idea of constantly testing the switches that are in use and the switches that are standing by as a back-up system. By constantly testing the back up switches, the invention is able to provide reliable back up switches when an active switch fails. This is in contrast to the APA, which did not test back up switches. When an active switch failed in the APA, it was possible that the back up switch would also fail, since constant testing was not done. In such an event, the entire switching system would not operate until the system could be manually replace, which would cause undesired down time. The Examiner argues that input signals are used to test optical paths, but the Examiner has failed to point out in a reference the teaching of test light sources in addition to input signals that are used to test optical paths. As recited in the text and in claim 6, test light is distinct from the input signals. Test light allows testing of the backup connections, while the input signals are routed through the active optical switch and cannot be used to test the backup connections. Test light allows testing the active optical switch connections in the absence of input light, such that the functionality of the active optical switch is known when the input light is first turned on. For at least these reasons, independent claims 1 and 11 are not made obvious by APA in view of Douklias.

The Examiner further rejected claims 6-10 & 12-14 under 35 U.S.C. 103 (a) as being unpatentable over Applicants' Admitted Prior Art (APA) in view of Baker (USPN 4,913,509) as applied above to claims 1 & 2, and further in view of Sato (JP 0279890 A).

The Examiner failed to specifically point out the reasons for the rejection of claims 12-14. The Examiner states that the rejection is based on APA in view of Baker as applied to claims 1 & 2 and further in view of Sato. Claims 12-14 are not dependent on claims 1 & 2. In addition, the Examiner failed to specifically point out how APA and Baker specifically applies to claim 11

upon which claims 12-14 depend. As mentioned above, the Examiner instead discusses Douklias.

Claims 2-10 and 12-19 each depend either directly or indirectly from the independent claims, and are therefore respectfully submitted to be patentable over the art of record for at least the reasons set forth above with respect to the independent claims. Additionally, these dependent claims require additional elements that, when taken in the context of the claimed invention, further patentably distinguish the art of record. For example, claims 2 and 15 further recite detectors optically connected to the output switches by optical fibers. The cited references do not disclose or suggest connecting detectors to the output switches by optical fibers.

In addition, claims 3 and 16 further recite a second plurality of detectors where each of the second plurality of detectors is connected to a test light by a fiber optic. Nothing in the cited references teaches or suggests this.

In addition, claim 4 further recites a third plurality of optical detectors which are each connected to an optical fiber of the first plurality of optical fibers, which are connected between the output connections of the input switches and the input connections of the central optical switches. The Examiner failed to point out anything in cited references that teach or suggest this.

In addition, claim 5 further recites input switches each connected to at least eight fibers of the third plurality of fibers. The Examiner failed to point out anything in cited references that teach monitoring paths through optical switches in a Clos configuration, where the number of input and output ports of the optical switching apparatus is greater than the number of input and output ports of the central switches.

In addition, claim 6 further recites a controller connected to each of the plurality of optical input switches, wherein the controller determines if one of the plurality of central optical switches is malfunctioning by testing a first plurality of optical paths using the test light sources and by simultaneously testing a second plurality of optical paths using input signals, which are not generated by the test light sources. The cited references do not disclose a controller that uses both test light sources and input signals to simultaneously test optical paths. The Examiner argues that input signals are used to test optical paths, but the Examiner has failed to point out in a reference the teaching of test light sources in addition to input signals that are used to test optical paths.

In addition, claim 7 has been amended to recite a controller connected to each of the plurality of optical input switches, the plurality of optical output switches, the plurality of central optical switches, the plurality of test light sources, and the first plurality of optical detectors, and wherein at least one of the plurality of central optical switches is an active optical switch and at least one of the plurality of central optical switches is an protection optical switch which acts as a back up for the active optical switch, wherein the controller determines if one of the plurality of central optical switches is malfunctioning, by simultaneously using input signals to test the active optical switch and the test light sources to test the protection optical switch. None of the cited references teach simultaneously using input signals to test an active optical switch and test light sources to test a protection switch which is a back up for the active optical switch. For at least these reasons, claims 2-10 and 12-19 are not anticipated or made obvious by the cited references.

In addition, claim 8 further recites an indicator that indicates if a central optical switch is malfunctioning. The Examiner failed to point out anything in cited references that teach or suggest this.

Applicants believe that all pending claims are allowable and respectfully request a Notice of Allowance for this application from the Examiner. Should the Examiner believe that a telephone conference would expedite the prosecution of this application, the undersigned can be reached at telephone number (831) 655-2300.

Respectfully submitted,
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